**Amendments to the Claims**

This listing of claims will replace the originally filed claims in the application.

**Listing of Claims:**

Claims 1 – 12 (cancelled)

Claim 13 (previously presented): A method for processing aluminum in a furnace, in which an aluminum-containing material is introduced into the furnace, comprising:

melting the material by heating using at least one burner supplied with oxidizer and with fuel, in order to obtain molten aluminum:

measuring at least one of carbon monoxide CO and hydrogen $H_2$ concentration in at least one of a furnace atmosphere and flue gases, wherein the oxidizer supplied to at least one burner comprises over about 10% by volume of oxygen; and

decreasing oxidation of the molten aluminum in an oxidation limitation phase, during which (i) flow rate of the oxidizer is substantially constant while flow rate of the fuel injected into the at least one burner is a function of at least one of the carbon monoxide and hydrogen concentration in at least one of atmosphere or the flue gases or (ii) the flow rate of the fuel is substantially constant while the flow rate of the oxidizer is a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases, at least one of the carbon monoxide and hydrogen concentration being regulated upon the decreasing to a setpoint C2 of between about 3 vol% and about 15 vol%, wherein, prior to the decreasing, at least one of the carbon monoxide and hydrogen concentration is regulated to a setpoint C1 different than the setpoint C2.

Claim 14 (previously presented): The method of claim 13, wherein the oxidizer comprises over about 88 vol% of $O_2$.

Claim 15 (previously presented): The method of claim 13, wherein the oxidizer is industrially pure oxygen.

Claim 16 (previously presented): The method of claim 13, wherein the fuel is selected from natural gas, hydrocarbons, and light or heavy fuel oil.

Claim 17 (previously presented): The method of claim 13, wherein volumetric ratio of oxygen to fuel is maintained between about 1 and about 5.

Claim 18 (previously presented): The method of claim 13, wherein the carbon monoxide and/or hydrogen concentration is maintained substantially constant throughout this oxidation limitation phase at the setpoint C2.

Claim 19 (previously presented): The method of claim 13, wherein the oxidation limitation phase is preceded by a hydrocarbon combustion phase during which substantially all organic compounds present in the material are destroyed by pyrolysis.

Claim 20 (previously presented w): The method of claim 19, wherein the hydrocarbon combustion phase is considered to terminate when a measured value of a ratio R of volumetric flow rate of oxygen to volumetric flow rate of fuel falls below a predefined value S.

Claim 21 (previously presented): The method of claim 20, wherein a stabilization phase takes place with a measured CO and/or $H_2$ concentration regulated to the setpoint C1, this phase terminating when the ratio R reaches its minimum.

Claim 22 (previously presented): The method of claim 13, wherein the oxidation limitation phase terminates with the reintroduction, into the furnace, of a new charge of aluminum-containing material.

Claim 23 (previously presented): The method of claim 13, wherein the CO concentration is measured using a laser diode.

Claim 24 (cancelled):

Claim 25 (previously presented): The method of claim 13, wherein volumetric ratio of oxygen to fuel is maintained between about 1.5 and about 3.

Claim 26 (previously presented): The method of claim 13, wherein the carbon monoxide and/or hydrogen concentration is maintained substantially constant throughout the oxidation limitation phase at the setpoint C2 of between about 6 vol % and about 10 vol %.

Claim 27 (previously presented): A method of processing aluminum in a furnace, in which an aluminum-containing material is introduced into the furnace, comprising:

melting the material by heating using at least one burner supplied with oxidizer and with fuel, in order to obtain molten aluminum;

measuring at least one of carbon monoxide CO and hydrogen H2 concentration in at least one of a furnace atmosphere and flue gases, wherein the oxidizer supplied to at least one burner comprises over about 10% by volume of oxygen;

regulating at least one of the carbon monoxide and hydrogen to a setpoint C1 while the molten aluminum is maintained in a first phase, wherein regulating to the setpoint C1 comprises (i) adjusting flow rate of the fuel injected into the at least one burner as a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while flow rate of the oxidizer is substantially constant or (ii) adjusting the flow rate of the oxidizer as a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while the flow rate of the fuel is substantially constant; and

regulating at least one of the carbon monoxide and hydrogen to a setpoint C2 while oxidation of the molten aluminum is decreased in a second phase, wherein regulating to the setpoint C2 comprises (i) adjusting the flow rate of the fuel injected into the at least one burner as function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while the flow rate of the oxidizer is substantially constant or (ii) adjusting the flow rate of the oxidizer as a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while the flow rate of the fuel is substantially constant, wherein the setpoint C2 is different than the setoint C1 and is between about 3 vol% and about 15 vol%.